

**Listing of Claims:**

1. (currently amended) An X-ray apparatus which includes:

an X-ray source for the emission of a conical X-ray beam, ~~said beam being wide enough to completely irradiate the X-ray detector in all possible orientations and positions;~~

an X-ray detector for the multiple detection of the X-rays after their passage through an object to be examined, being arranged along an object axis, while the X-ray source and the X-ray detector are displaced along a trajectory;

means for changing at least one of the position and/or the orientation of the X-ray detector relative to the X-ray source; and

a control unit for displacing the X-ray source and the X-ray detector along the trajectory and for controlling, rotationally on a central axis of said beam, orientation of the X-ray detector during the detection of the X-rays, wherein the position and orientation of the X-ray detector relative to the X-ray source is over a range, and wherein the conical X-ray beam is wide enough to completely irradiate the X-ray detector over the entire range.

2. (currently amended) An X-ray apparatus which includes an X-ray source for the emission of a conical X-ray beam, ~~said beam being wide enough to completely irradiate the X-ray detector in all possible orientations and positions;~~

and an X-ray detector for the multiple detection of the X-rays after their passage through an object to be examined, being arranged along an object axis, while the X-ray source and the X-ray detector are displaced along a trajectory, characterized in that the apparatus includes means for changing at least one of the position and/or the orientation of the X-ray detector relative to the X-ray source and also a control unit for displacing the X-ray source and the X-ray detector along the trajectory and for controlling at least one of the position and/or orientation of the X-ray detector during the detection of the X-rays, characterized in that the X ray apparatus includes a flat, rectangular X-ray detector which

is rotatable around the connecting line extending between the focal point of the X-ray source and the center of the X-ray detector, the control unit for controlling the orientation of the X-ray detector being constructed in such a manner that one of the edges of the X-ray detector is always situated at right angles to the object axis while the trajectory is being completed, wherein the X-ray detector and the X-ray source are movably connected to each other by an arm.

3. (previously presented) An X-ray apparatus as claimed in claim 2, wherein for circular trajectories the control unit is arranged to adjust the orientation of the X-ray detector prior to the beginning of the completion of each trajectory in such a manner that one of the edges of the X-ray detector is situated at right angles to the object axis and that the orientation of the X-ray detector is kept constant while the trajectory is being completed.

4. (currently amended) An X-ray apparatus as claimed in claim 2, wherein the control unit is arranged to adjust the orientation in response to any change of the position of the X-ray source while a trajectory is being completed, and wherein the position and orientation of the X-ray detector relative to the X-ray source is over a range, and wherein the conical X-ray beam is wide enough to completely irradiate the X-ray detector over the entire range.

5. (currently amended) An X-ray apparatus which includes an X-ray source for the emission of a conical X-ray beam, ~~said beam being wide enough to completely irradiate the X-ray detector in all possible orientations and positions;~~  
and an X-ray detector for the multiple detection of the X-rays after their passage through an object to be examined, being arranged along an object axis, while the X-ray source and the X-ray detector are displaced along a trajectory, characterized in that the apparatus includes means for changing at least one of the position and/or the orientation of the X-ray detector relative to the X-ray source and also a control unit for displacing the X-ray source and the X-ray detector along the trajectory and for controlling at least one of the

position and/or orientation of the X-ray detector during the detection of the X-rays, characterized in that the means for changing at least one of the position and/or the orientation of the X-ray detector are constructed in such a manner that the angle between the central ray of the X-ray beam and the connecting line extending between the focal point of the X-ray source and the center of the X-ray detector can assume a value other than zero, and that the control unit is constructed in such a manner that at least two different angular positions are adjusted during the detection of the X-rays, wherein the position and orientation of the X-ray detector relative to the X-ray source is over a range, and wherein the conical X-ray beam is wide enough to completely irradiate the X-ray detector over the entire range.

6. (currently amended) An X-ray apparatus as claimed in claim 5, wherein the X-ray detector is arranged on one or more rails in order to change at least one of its position and/or its orientation, and wherein the X-ray detector and the X-ray source are movably connected to each other by an arm.

7. (currently amended) An X-ray apparatus as claimed in claim 6, wherein in order to change at least one of its position and/or its orientation, the X-ray detector is mounted on a rail which extends essentially perpendicularly to the central ray, ~~notably on a rail which is~~ and wherein the rail is curved around the focal point of the X-ray source.

8. (previously presented) An X-ray apparatus as claimed in claim 5, wherein the X-ray detector is a flat, rectangular X-ray detector.

9. (previously presented) An X-ray apparatus as claimed in claim 5, wherein the control unit is arranged for the multiple displacement of the X-ray source along a trajectory during the irradiation of the object to be examined and for the adjustment of a different angular position of the X-ray detector during each completion of the same trajectory.

10. (currently amended) A method for forming X-ray images, comprising:

emitting, by an X-ray source, a conical X-ray beam for detection, by an X-ray detector, of X-rays after their passage through an object to be examined while the X-ray source and the X-ray detector are displaced along a trajectory, ~~said beam being wide enough to completely irradiate the X-ray detector in all possible orientations and positions; and~~

in order to maximize a reconstructable examination zone, moving, during said detection, the X-ray detector so as to off-center position of the X-ray detector from said beam and/or so as to change orientation of the X-ray detector relative to the X-ray source, wherein a position and orientation of the X-ray detector relative to the X-ray source is over a range, and wherein the conical X-ray beam is wide enough to completely irradiate the X-ray detector over the entire range.

11. (previously presented) A computer program product having a computer readable medium in to which is embodied a computer program executable by a computer to perform the method of claim 10.

12. (previously presented) The method of claim 10, further comprising performing said moving off-center on a track.

13. (previously presented) The method of claim 12, wherein said track is curved to maintain the detector facing the source.

14. (previously presented) The method of claim 10, wherein said zone is in the shape of a cylinder.

15. (previously presented) A device for performing the method of claim 10, said device comprising said X ray source, said X ray detector, and a controller for said moving.

16. (previously presented) The X-ray apparatus of claim 5, including a flat, rectangular X-ray detector configured for rotation around the connecting line extending between the focal point of the X-ray source and the center of the X-ray detector, the control unit for controlling the orientation of the X-ray detector being constructed in such a manner that one of the edges of the X-ray detector is always situated at right angles to the object axis while the trajectory is being completed.

17. (previously presented) The X-ray apparatus of claim 6, including a flat, rectangular, non-square X-ray detector configured for rotation around the connecting line extending between the focal point of the X-ray source and the center of the X-ray detector, the control unit for controlling the orientation of the X-ray detector being constructed in such a manner that one of the edges of the X-ray detector is always situated at right angles to the object axis while the trajectory is being completed.

18. (previously presented) The X-ray apparatus of claim 7, including a flat, rectangular X-ray detector configured for rotation around the connecting line extending between the focal point of the X-ray source and the center of the X-ray detector, the control unit for controlling the orientation of the X-ray detector being constructed in such a manner that one of the edges of the X-ray detector is always situated at right angles to the object axis while the trajectory is being completed.

19. (previously presented) The X-ray apparatus of claim 8, including a flat, rectangular, non-square X-ray detector configured for rotation around the connecting line extending between the focal point of the X-ray source and the center of the X-ray detector, the control unit for controlling the orientation of the X-ray detector being

constructed in such a manner that one of the edges of the X-ray detector is always situated at right angles to the object axis while the trajectory is being completed.

20. (previously presented) The X-ray apparatus of claim 9, including a flat, rectangular X-ray detector which is rotatable around the connecting line extending between the focal point of the X-ray source and the center of the X-ray detector, the control unit for controlling the orientation of the X-ray detector being constructed in such a manner that one of the edges of the X-ray detector is always situated at right angles to the object axis while the trajectory is being completed.